Electrician/Electrical Engineer

23 Sep 10:30
Duty six : Red

Start	Time	Activity	Requirements	Instructions	Scouter
Electricity can do much more than just light up our houses and sreets. Circuits, resistors, capacitors, diodes and switches can make electricity do almost anything you can imagine					
23 Sep 10:30	5	**Activities :** Opening	Register, beans, flag, totem and skin	Grand Howl Flag Break Register Inspection - belts and shoes	Akela
Conductors let electricity flow and insulators stop electricity					
23 Sep 10:35	5	**Game :** Conductors and Insulators		Divide the pack into 2 teams. One team is conductors and one team is insulators. All the Cubs run about and try to join with their own kind. However, the insulators must try to join together and surround the conductors before they reach the power source (large tyre or chosen base).	Bagheera
We are going to make a simple circuit that will make a light show in your room					
23 Sep 10:40	35	**Activities :** Pinhole Planetarium	Plastic bowl with lid per Cub Black spray paint Electrical wire (pre-solder to LED and veroboard) 3W White LED per Cub 2 AA Batteries per Cub Veroboard Insulation tape Split pins Metal paper clips Pin Constellation template (attached)	Spray paint the bowls and lid black. In the bowl, punch small pin holes in the shape of the constellations, using the template below. On the lid, build the circuit as follows: • Tape/glue the LED withtwo wires to the centre of the lid • Connect the batteries together with insulation tape, facing opposite directions and touching the veroboard piece provided. Test that current is flowing • Place the small veroboards connected to LED onto a strip of insulation and attach to the battery pack • Bend the paper clip into the shape of a switch. Measure the distance and place the two split pins at the measured distance by pushing the legs through the lid • Connect the wires to the split pins • Paper clip acts as the switch • Attach battery pack to side of the lid and tape in place • Place the bowl back on the lid. Use the paper clip to switch on and off	Akela
How many of you have a computer at home or school? Do you know what it looks like inside? Should we find out?					
23 Sep 11:15	10	**Game :** Computer parts memory		Have an old computer or a variety of broken electronic devices that can be taken apart to show the Cubs the various components. See how many they can remember and pass the items around if possible. * Motherboard * Central Processing Unit	Akela

				* Fan * Power supply * Memory * Hard Drive * Cables * Resistor * Capacitor * Solder * Controller Card * Etc.	
You should never eat and drink near electronic devices so let's go outside for juice and biscuits					
23 Sep 11:25	5	**Activities :** Juice and biscuits		Juice and biscuit break	Mang
Electronics are programmed through on/off swtiches. In computers, these on/off or 1s and 0s can make up complicated instructions. Write your own programme to get out of a maze					
23 Sep 11:30	20	**Game :** Get me out of this maze!		Create a maze out of staves (outside) or straws/earbuds/skewers (indoors). Cubs (in teams of 2) to write instructions to get from the centre of the maze to the exit (eg. walk forward two steps, turn right 90 degrees, etc.). When they believe the instructions are ready, one member of the team goes to the starting point of the maze (or places an object in the centre of the maze if indoors) The second member of the team calls out the instructions in order. The Cub in the maze must follow the instructions EXACTLY. Challenge them if the instructions aren't specific enough. If their programme is not correct, they can go back and rework it and try again.	Akela
Most electronic devices need to be plugged in at some stage, even if it is just to charge. Wiring a plug has to be done correctly so that you are safe					
23 Sep 11:50	20	**Activities :** Wiring a Plug	plugs, wires, cutters, screwdrivers, instructions	**Wiring a Plug** 1. Bare the ends of the three wires inside the electrical cord for about half a centimeter, by cutting away the plastic insulation. 2. Gently twist the strands of copper wire with your fingers until each strand is tight. 3. Fold over the twisted strands. 4. Remove the plug cover by either "snapping" or	Bagheera

unscrewing it.

5. Unscrew the little screws on each of the plug's pins.
6. Insert the twisted copper wires into the holes in the pins.
7. The green and yellow wire must always be inserted into the top pin.
8. The blue wire is inserted into the left pin (the pin is marked with a blue spot or the letter N).
9. The brown wire is inserted into the right pin (the pin is marked with a brown spot or the letter L)
10. Tighten the little screw on each of the plug's pins.
11. Make sure the electrical cord is firmly gripped by the arrestor clips.
12. Replace the cover of the plug.

Bare the ends of the three wires inside the electrical cord for about half a centimeter, by cutting away the plastic insulation.	Gently twist the strands of copper wire with your fingers until each strand is tight. Fold over the twisted strands.
Remove the plug cover by either "snapping" or unscrewing it.	Unscrew the little screws on each of the plug's pins.
Insert the twisted copper wires into the holes in the pins. The brown wire is inserted into the right pin (the pin is marked with a brown spot or the letter L)	Tighten the little screw on each of the plug's pins.
Make sure the electrical cord is firmly gripped by the arrestor clips. The green and yellow wire must always be inserted into the top pin.The blue wire is inserted into the	Replace the cover of the plug

				left pin (the pin is marked with a blue spot or the letter N).	
Electricity travels up (or down) a wire, just like our balloon rockets					
23 Sep 12:10	15	**Game :** Balloon Rockets		Set up a string from a high point down to the ground. Each Cub to blow up their balloon and tape a straw onto the side Each Cub to take turns to launch their rocket by placing the string through the straw and letting go of the mouth of the balloon (allowing the air to escape). Remember to hold the string taut so that the balloon travels up the string	Akela
Find out how something works this weekend - any electronic device					
23 Sep 12:25	5	**Activities :** Closing	Totem, Skin Badges, certificates	Announcements Badge handouts Grand Howl Flag Down Prayer Dismiss	Akela

Programme prepared on 09 May 00:29

Pinhole Planetarium

Category	Activities
Badge	Skies
Time to allocate (mins)	35
Outcome	Basic electronics project to create a pinhole planetarium of some of the major constellations in the southern hemisphere
Resources	Plastic bowl with lid per Cub Black spray paint Electrical wire (pre-solder to LED and veroboard) 3W White LED per Cub 2 AA Batteries per Cub Veroboard Insulation tape Split pins Metal paper clips Pin Constellation template (attached)
Instructions	Spray paint the bowls and lid black. In the bowl, punch small pin holes in the shape of the constellations, using the template below. On the lid, build the circuit as follows: • Tape/glue the LED withtwo wires to the centre of the lid • Connect the batteries together with insulation tape, facing opposite directions and touching the veroboard piece provided. Test that current is flowing • Place the small veroboards connected to LED onto a strip of insulation and attach to the battery pack • Bend the paper clip into the shape of a switch. Measure the distance and place the two split pins at the measured distance by pushing the legs through the lid • Connect the wires to the split pins • Paper clip acts as the switch • Attach battery pack to side of the lid and tape in place • Place the bowl back on the lid. Use the paper clip to switch on and off

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Entry written by Sharon Venn of 1st Randburg

Documents

Constellations	constellations.png
Instructions with photos	Pinhole_Planetarium.docx

Get me out of this maze!

Category	Game
Type	Team game
Time to allocate (mins)	20
Instructions	Create a maze out of staves (outside) or straws/earbuds/skewers (indoors). Cubs (in teams of 2) to write instructions to get from the centre of the maze to the exit (eg. walk forward two steps, turn right 90 degrees, etc.). When they believe the instructions are ready, one member of the team goes to the starting point of the maze (or places an object in the centre of the maze if indoors) The second member of the team calls out the instructions in order. The Cub in the maze must follow the instructions EXACTLY. Challenge them if the instructions aren't specific enough. If their programme is not correct, they can go back and rework it and try again.

Entry written by Sharon Venn of 1st Randburg

Documents

Binary code example	binary_code.png
Maze Template easy	9a012760368765d7adaf3680351b39db--sew-toys-maze.jpg
Maze template difficult	maze.png
